

**PATENT****AMENDMENTS TO THE CLAIMS**

Following is a complete set of claims as amended with this Response. This complete set of claims includes amended claim 35.

1-14. (Previously Cancelled)

15. (Withdrawn) An implantable medical device comprising:  
signal processing means for detecting an interatrial conduction disturbance of a heart; and  
pulse generator circuit means for delivering atrial arrhythmia prevention pacing pulses to the heart responsive to the detection of the interatrial conduction disturbance.

16. (Withdrawn) The implantable medical device of claim 15, wherein the interatrial conduction disturbance is a P-wave duration in excess of a predetermined criterion and wherein the signal processing means includes P-wave duration timing means for determining durations of detected P-waves.

17. (Withdrawn) The implantable medical device of claim 15, wherein the interatrial conduction disturbance is an average P-wave duration in excess of a predetermined criterion and wherein the signal processing means includes P-wave duration timing means for determining durations of detected P-waves and duration averaging means for averaging determined P-wave durations.

18. (Withdrawn) The implantable medical device of claim 15, wherein the interatrial conduction disturbance is an interatrial delay time in excess of a predetermined criterion, wherein the implantable medical device includes first detecting means for detecting right atrial activations and second detecting means for detecting left atrial activation, and wherein the signal processing means includes interatrial delay timing

**PATENT**

means for timing interatrial delay times between activations detected by the first detecting means and the second detecting means.

19. (Withdrawn) The implantable medical device of claim 15, wherein the atrial arrhythmia prevention pacing pulses are atrial overdrive pacing pulses and wherein the pulse generator circuit means includes an atrial overdrive pulse generator means for providing atrial overdrive pacing pulses to the heart responsive to the detection of the interatrial conduction disturbance.

20. (Withdrawn) The implantable medical device of claim 15, wherein the pulse generator means includes atrial pacing means for delivering an atrial pacing pulse a delay time after a detected P-wave.

21. (Withdrawn) The implantable medical device of claim 20, further including P-wave duration timing means for determining durations of detected P-waves and control means for varying the delay time responsive to determined P-wave durations.

22. (Withdrawn) The implantable medical device of claim 20, further including P-wave duration timing means for determining durations of detected P-waves and pacing control means for varying the delay time in an inverse relation to determined P-wave durations.

23. (Withdrawn) The implantable medical device of claim 15, wherein the interatrial conduction disturbance is a selected difference between detected odd and even P-waves exceeding a predetermined criterion and wherein the signal processing means includes means for determining if the selected difference between the odd and even P-waves exceeds the predetermined criterion.

**PATENT**

24. (Withdrawn) The implantable medical device of claim 15, wherein the interatrial conduction disturbance is a predetermined spectral energy distribution of detected P-waves, and wherein the signal processing means includes spectral analyzing means for performing spectral energy distribution analysis of the detected P-waves.

25. (Withdrawn) The implantable medical device of claim 15, wherein the signal processing means includes a broad field atrial activity detector.

26. (Withdrawn) The implantable medical device of claim 15, wherein the signal processing means includes a near-field atrial activity detector and broad field atrial activity detector.

27. (Withdrawn) The implantable medical device of claim 15, wherein the pulse generator circuit means includes a right atrial pulse generator and left atrial pulse generator.

28. (Withdrawn) The implantable medical device of claim 15, further including pacing control means for causing the pulse generator circuit means to terminate the delivery of atrial arrhythmia prevention pacing pulses to the heart when the interatrial conduction disturbance has subsided.

29. (Previously Cancelled)

30. (Previously Presented) A method of pacing a heart to prevent an atrial arrhythmia, the method comprising the steps of:

detecting an interatrial conduction disturbance of the heart; and

delivering atrial arrhythmia prevention pacing pulses to the heart responsive to detecting the interatrial conduction disturbance;

wherein the interatrial conduction disturbance is a P-wave duration in excess of a predetermined criterion and wherein the method further comprises the step of determining durations of detected P-waves.

**PATENT**

31. (Previously Presented) The method of claim 30, wherein the interatrial conduction disturbance is an average P-wave duration in excess of a predetermined criterion and wherein the method further comprises the step of averaging the determined P-wave durations.

32. (Previously Presented) The method of claim 30, wherein the interatrial conduction disturbance is an interatrial delay time in excess of a predetermined criterion and wherein the method further comprises the steps of detecting right atrial activations, detecting left atrial activations, and timing interatrial delay times between right atrial activation detection and left atrial activation detection.

33. (Previously Presented) The method of claim 30, wherein the atrial arrhythmia prevention pacing pulses are atrial overdrive pacing pulses and wherein the delivering step comprises providing atrial overdrive pacing pulses to the heart.

34. (Previously Cancelled)

35. (Currently Amended) A method of pacing a heart to prevent an atrial arrhythmia, the method comprising the steps of:

detecting an interatrial conduction disturbance of the heart;

delivering atrial arrhythmia prevention pacing pulses to the heart responsive to detecting the interatrial conduction disturbance;

detecting P-waves of the heart and wherein the delivering step comprises delivering an atrial pacing pulse at a delay time after each detected P-wave; and

determining durations of detected P-waves and wherein the delivering step further comprises varying the delay time responsive to determined P-wave durations.

**PATENT**

36. (Previously Presented) The method of claim 35, wherein the delivering step further comprises varying the delay time in an inverse relation to determined P-wave durations.

37. (Previously Presented) A method of pacing a heart to prevent an atrial arrhythmia, the method comprising the steps of:

- detecting an interatrial conduction disturbance of the heart;
- delivering atrial arrhythmia prevention pacing pulses to the heart responsive to detecting the interatrial conduction disturbance; and
- detecting P-waves of the heart, wherein the interatrial conduction disturbance is a selected difference between detected odd and even P-waves exceeding a predetermined criterion, and wherein the detecting step comprises determining if the selected difference between the odd and even P-waves exceeds a predetermined criterion.

38. (Previously Presented) A method of pacing a heart to prevent an atrial arrhythmia, the method comprising the steps of:

- detecting an interatrial conduction disturbance of the heart;
- delivering atrial arrhythmia prevention pacing pulses to the heart responsive to detecting the interatrial conduction disturbance; and
- detecting P-waves of the heart, wherein the interatrial conduction disturbance is a predetermined spectral energy distribution of detected P-waves, and wherein the method further comprises the step of performing spectral energy distribution analysis of the detected P-waves.

**PATENT**

39. (Previously Presented) A method of pacing a heart to prevent an atrial arrhythmia, the method comprising the steps of:
- detecting an interatrial conduction disturbance of the heart; and
  - delivering atrial arrhythmia prevention pacing pulses to the heart responsive to detecting the interatrial conduction disturbance;
  - wherein detecting the interatrial conduction disturbance of the heart comprises sensing broad near-field atrial activity.
40. (Previously Presented) A method of pacing a heart to prevent an atrial arrhythmia, the method comprising the steps of:
- detecting an interatrial conduction disturbance of the heart; and
  - delivering atrial arrhythmia prevention pacing pulses to the heart responsive to detecting the interatrial conduction disturbance;
  - wherein detecting the interatrial conduction disturbance of the heart comprises sensing near-field atrial activity and far-field atrial activity.
41. (Previously Presented) The method of claim 30, wherein the delivery step includes delivering right atrial pacing pulses and left atrial pacing pulses.
42. (Previously Presented) The method of claim 30, further including the step of terminating the delivery of the atrial fibrillation prevention pacing pulses to the heart when the interatrial conduction disturbance ceases.